

Form PTO-1449		
ATTY DOCKET NO.: 57-00	SERIAL NO.: 09/653,437	FILING DATE: September 1, 2000
APPLICANT: Xue and Walba		GROUP: 2674

U.S. PATENT DOCUMENTS

Exmr. Initial	Document Number	Date	Name	Class	Subclass	Filing Date if Appropriate
CH	6,084,649	07/04/00	Amano et al.	349	96	
CH	6,057,007	05/02/00	Amano et al.	428	1	
CH	6,051,639	04/18/00	Mehl et al.	524	205	
CH	6,045,720	07/04/00	Shundo et al.	252	299.64	
CH	6,030,547	02/29/00	Hasegawa et al.	252	299.61	
CH	6,019,911	02/01/00	Hirano et al.	252	299	
CH	6,018,070	01/25/00	Ito et al.	560	76	
CH	6,007,737	12/28/99	Nishiyama et al.	252	299.01	
CH	6,002,042	12/14/99	Mine et al.	560	66	
CH	6,001,278	12/14/99	Matsumoto et al.	252	299.65	
CH	5,985,172	11/16/99	Motoyama et al.	252	299.64	
CH	5,980,780	11/09/99	Motoyama et al.	252	299.64	
CH	5,976,409	11/02/99	Mineta et al.	252	299.65	
CH	5,972,243	10/26/99	Mine et al.	252	299.65	
CH	5,972,241	10/26/99	Johnson et al.	252	299.61	
CH	5,968,413	10/19/99	Mine et al.	252	299.65	
CH	5,951,914	09/14/99	Matsumoto et al.	252	299.67	
CH	5,949,391	09/07/99	Saishu et al.	345	50	
CH	5,943,112	08/24/99	Mochizuki et al.	349	173	
CH	5,942,155	08/24/99	Coles et al.	252	299.64	
CH	5,938,973	08/17/99	Motoyama et al.	252	299.65	
CH	5,936,689	08/10/99	Saishu et al.	349	123	

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CH		5,928,562	07/27/99	Kistner et al.	252	299.6	
CH		5,922,242	07/13/99	Saishu et al.	252	299.62	
CH		5,888,420	03/30/99	Sakai et al.	252	299.01	
CH		5,861,109	01/19/99	Goodby et al.	252	299.65	
CH		5,861,108	01/19/99	Ishida et al.	252	299.62	
CH		5,858,273	01/12/99	Asaoka et al.	252	299.4	
CH		5,856,815	01/05/99	Mochizuki et al.	345	97	
CH		5,855,813	01/05/99	Coles et al.	252	299.5	
CH		5,855,812	01/05/99	Radcliffe et al.	252	299.01	
CH		5,827,448	10/27/98	Konuma et al.	252	299.61	
CH		5,808,800	09/15/98	Handschy et al.	359	630	
CH		5,770,108	06/23/98	Totani et al.	252	299.61	
CH		5,750,214	05/12/98	Ito et al.	428	1	
CH		5,748,164	05/05/98	Handschy et al.	345	89	
CH		5,728,864	03/17/98	Motoyama et al.	560	59	
CH		5,723,069	03/03/98	Mineta et al.	252	299.67	
CH		5,719,653	02/17/98	Minato et al.	349	156	
CH		5,702,637	12/30/97	Johnson et al.	252	299.61	
CH		5,695,683	12/09/97	Takeichi et al.	252	299.61	
CH		5,660,762	08/26/97	Ito et al.	252	299.67	
CH		5,658,491	08/19/97	Kistner et al.	252	299.01	
CH		5,595,682	01/21/97	Goodby et al.	252	299.01	
CH		5,583,682	12/10/96	Kitayama et al.	349	172	
CH		5,568,299	10/22/96	Yoshihara et al.	359	100	

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CH		5,547,604	08/20/96	Coles et al.	252	299.01	
CH		5,543,078	08/06/96	Walba et al.	252	299.65	
CH		5,534,190	07/09/96	Johno et al.	252	299.65	
CH		5,529,718	06/25/96	Hornung et al.	252	299.61	
CH		5,498,368	03/12/96	Coles	252	294.67	
CH		5,482,650	01/09/96	Janulis et al.	252	299.01	
CH		5,474,705	12/12/95	Janulis et al.	252	299.01	
CH		5,455,697	10/03/95	Coles et al.	359	103	
CH		5,437,812	08/01/95	Janulis et al.	252	299.01	
CH		5,417,883	05/23/95	Epstein et al.	252	299.01	
CH		5,399,701	03/21/95	Janulis	546	298	
CH		5,399,291	03/21/95	Janulis et al.	252	299.01	
CH		5,389,287	02/14/95	Nishiyama et al.	252	299.01	
CH		5,378,396	01/03/95	Yui et al.	252	299.65	
CH		5,377,033	12/27/94	Radcliffe	359	75	
CH		5,374,375	12/20/94	Yui et al.	252	299.65	
CH		5,367,391	11/22/94	Johno et al.	359	56	
CH		5,352,379	10/04/94	Nishiyama et al.	252	299.62	
CH		5,348,685	09/20/94	Mochizuki et al.	252	299.62	
CH		5,346,646	09/13/94	Kawabata et al.	252	299.62	
CH		5,340,498	08/23/94	Arai et al.	252	299.65	
CH		5,327,273	07/05/94	Beresnev et al.	359	104	
CH		5,322,639	06/21/94	Kawabata et al.	252	299.62	
CH		5,275,757	01/04/94	Mineta et al.	252	299.61	

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CH		5,262,082	11/16/93	Janulis et al.	252	299.01	
CH		5,254,747	10/19/93	Janulis	568	650	
CH		5,169,556	12/08/92	Mochizuki	252	299.62	
CH		5,110,497	05/05/92	Suzuki et al.	252	299	
CH		5,082,587	01/21/92	Janulis	252	299.01	
CH		5,062,691	11/05/91	Tristani-Kendra et al.	359	56	
CH		4,886,619	12/12/89	Janulis	252	299.1	
CH		4,367,924	01/11/83	Clark et al.	350	334	

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		Document Number	Date	Country	Class	Subclass	Translation Yes/No
CH	✓	WO 00/31210 A1	06/02/00	PCT	C09K	19/04	
CH	✓	WO 99/33814 A1	07/08/99	PCT	C07D	239/26	
CH	✓	WO 97/36908 A1	10/09/97	PCT	C07F	7/21	
CH	✓	WO 91/00897 A1	01/24/91	PCT	C09K	19/34	
CH	✓	EP 736,078 B1	06/24/98	EP	C09K	19/04	
	✓	EP 579,545 B1	12/03/97	EP	G02F	1/1337	
CH	✓	EP 425,304 B1	07/17/96	EP	G02F	1/137	
	✓	EP 405,868 A2	02/01/91	EP	C09K	19/42	
CH	✓	EP 255,236 B1	05/04/94	EP	C09K	19/20	
CH	✓	JP 8082778A	03/26/96	JP	G02F	1/13	
	✓	A-1-316372	12/21/89	JP	C07D	319/06	
	✓	A-1-316367	12/21/89	JP	C07D	239/26	
	✓	A-1-316339	12/21/89	JP	C07C	43/20	
	✓	A-1-228128	08/15/00	JP	H01H	13/04	
	✓	A-1-213390	08/28/89	JP	C09K	19/46	

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OTHER PRIOR ART (including Author, Title, Date, Pertinent Pages, etc.)

CH	—	Arnett, K.E. et al., "Technique For Measuring Electronic-Based Electro-Optic Coefficients of Ferroelectric Liquid Crystals" (1995), <i>Mat. Res. Soc. Symp. Proc.</i> 392 :135-146
CH	✓	Blinov L.M. and Tournilhac, F., "Infra-Red Dichroism of Mesophases Formed By Polyphilic Molecules. 1. Development of the Technique and Study of Compounds With One Long Perfluorinated Tail"(1993), <i>Molecular Materials</i> 3 (1):93-111
CH	✓	Booth, C.J. et al., "The ferro-,ferri- and antiferro-electric properties of a series of novel 2- or 3-substituted-alkyl 4-(4'-dodecyloxybiphenyl-4-carboxyloxy)-benzoate esters" (1996), <i>Liquid Crystals</i> 20 (6):815-823
CH	=	Booth, C.J. et al., "Achiral swallow-tailed materials with 'antiferroelectric-like' structure and their potential use in antiferroelectric mixtures" (1996), <i>Liquid Crystals</i> 20 (4):387-392
CH	—	Chandani, A.D. et al., "Novel Phases Exhibiting Tristable Switching" (July 1989), <i>Jpn. J. App. Phys.</i> 28 :L1261-1264
CH	✓	Chandani, A.D. et al., "Antiferroelectric Chiral Smectic Phases Responsible for the Tristable Switching in MHPOBC"(July 1989), <i>Jpn. J. App. Phys.</i> 28 :L1265-1268
CH	✓	Chandani, A.D. et al., "Tristable Switching in Surface Stabilized Ferroelectric Liquid Crystals with a Large Spontaneous Polarization" (May 1988), <i>Jpn. J. App. Phys.</i> 27 (5):L729-L732
CH	✓	Clark, N.A. and Lagerwall, S.T., "Submicrosecond bistable electro-optic switching in liquid crystals"(June 1980), <i>Appl. Phys. Lett.</i> 36 :899
CH	✓	Dawson, D.J. et al., "Cocyclotrimerization of Aryl Acetylenes: Substituent Effects on Reaction Rate" <i>Am. Chem. Soc. Sym.</i> 346 Ch 38:446-456
CH	✓	de Vries, A., "Experimental Evidence Concerning Two Different Kinds Of Smectic C To Smectic A Transitions" (1977), <i>Mol. Cryst. Liq. Cryst. (Letters)</i> 41 :27-31
CH	✓	de Vries, A., "The Implications of the Diffuse-Cone Model for Smectic <u>A</u> and <u>C</u> Phases and <u>A-C</u> Phase Transitions" (1979), <i>Mol. Cryst. Liq. Cryst (Letter)</i> . 49 :179-185
CH	✓	Drzewinski, W. et al. "Antiferroelectric Liquid Crystals with Fluorinated Parts of Terminal Chains" CAPLUS 1998:624787
CH	✓	Edgar, K. J. and Falling, S.N., "An Efficient and Selective Method for the Preparation of Iodophenols" (1990) <i>Org. Chem.</i> 55 : 5287-5291

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CH	/	Fleming, F. F. and Jiang, T., "Unsaturated Nitriles: Optimized Coupling of the Chloroprene Grignard Reagent ¹ with w-Bromonitriles" <i>J. Org. Chem.</i> (1997) 62 :7890-7891
CH	/	Gorecka, E. et al., "Molecular Orientational Structures in Ferroelectric, Ferrielectric and Antiferroelectric Smectic Liquid Crystal Phases as Studied by Conoscope Observation" (January 1990), <i>Jap. J. Appl. Phys.</i> 29 (1):L131-L137
CH	/	Hartmann, W., "Uniform SSFLC Director Pattern Switching" (1988), <i>Ferroelectrics</i> 85 :67-77
CH	/	Heinemann, S. et al., "Synthesis and Dielectric Investigations of New Swallow-Tailed Monomers and Polymers" (1993), <i>Mol. Cryst. Liq. Cryst.</i> 237 :277-283
CH	/	Heinemann, S. et al., "Competition between dipolar and steric interactions in swallow-tailed compounds" (1993), <i>Liquid Crystals</i> 13 (3):373-380
CH	/	Hide, F. et al., "Dynamic Polarized Infrared Spectroscopy of Electric Field-Induced Molecular reorientation in a Chiral Smectic-A Liquid Crystal" (Sept. 1995), <i>Phys. Rev. Lett.</i> 75 :2344-2347
CH	/	Inui, S. et al., "Thresholdless antiferroelectricity in liquid crystals and its application to displays"(1996), <i>J. Mater. Chem.</i> 6 (4):671-673
CH	/	Johno, M. et al., "Correspondence between Smectic Layer Switching and DC Hysteresis of Apparent Tilt Angle in an Antiferroelectric Liquid Crystal Mixture" (January 1990), <i>Jap. J. Applied Phys.</i> 29 :L111-114
CH	/	Johno, M. et al., "Smectic Layer Switching by an Electric Field in Ferroelectric Liquid Crystals Cells" (January 1989), <i>Jpn. J. App. Phys.</i> 28 :L119-120
CH	/	Kagawa, A. et al., "Fast Response Time STN=LCD with High Contrast Ratio" (1995), <i>Proceedings of the 15th International Display Research Conference</i> 177-180
CH	/	Klöpfer et al., "IR-Modulation Spectroscopy on the Collective Dynamics of Free-Standing Ferroelectric Liquid Crystalline Films" (January 1997), <i>J. Physique II</i> 7 (1):57-67
CH	?	Matsumoto, T. et al., "A novel property caused by frustration between ferroelectricity and antiferroelectricity and its application to liquid crystal displays—frustoelectricity and V-shaped switching" (September 1999) <i>J. Mater. Chem.</i> 9 :2051-2080
CH	/	Mikami, K. et al., "Binaphthol-Titanium Complex-Catalyzed Fluoral-Ene Reaction with Vinyl Sulfides for Asymmetric Synthesis of Diastereomeric a Trifluoromethyl-b-methyl Carbinols: Diastereomer Switch of Antiferroelectric or Ferroelectric Properties of Diastereomeric Liquid-Crystalline Systems ¹ " (September 1996) <i>SYNLETT</i> 837-838

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CH		✓	Mochizuki, A. et al., "A High Contrast and High Transmittance Multiplexing SSFLC Display Utilizing Naphthalene Base Liquid Crystal Materials" (1991), <i>Ferroelectrics</i> 122 :37-51
CH		✓	Mottram, N.J. and Elston, S.J., "Preliminary communication Thresholdless switching induced by polar anchoring in antiferroelectric liquid crystals" (1999) <i>Liquid Crystals</i> 26 (12):1853-1856
CH		✓	Nakagawa, A., "A Hysteresis Model for Antiferroelectric SmC _A " (August 1991), <i>Jap. J. App. Phys.</i> 30 :L1759-1764
CH		✓	Ostrovskii, B.I. et al., "Evidence of Tilted Dimeric Mesophase for Terminally Polar Polyphilic Mesogens" (1995), <i>J. Physique II</i> 5 (7):979-1001
CH		✓	Park, B. et al., "Molecular motion in a smectic liquid crystal showing V-shaped switching as studied by optical second-harmonic generation" (April 1999) <i>Physical Review E</i> 59 (4) 3815-3818
CH		✓	Perova, T.S. et al., "Study Of The Molecular Orientation In A Chiral Smectic Liquid Crystal Mixture using Infrared Dichroism" (1996), <i>Ferroelectrics</i> 180 (1-4):105-115
CH		✓	Redmond, M. et al., "Ferroelectric and Electroclinic Characterisation of a New Organic Siloxane Bimesogen." (1992) <i>Ferroelectrics</i> 148 :323-336
CH		✓	Rieker, T.P. et al., "Chevron" Local Layer Structure in Surface-Stabilized Ferroelectric Smectic-C Cells" (Dec. 1987), <i>Physical Rev. Letts.</i> 59 (23):2658-2661
CH		✓	Rudquist, J.P. et al., "The case of thresholdless antiferroelectricity: polarization-stabilized twisted SmC* liquid crystals give V-shaped electro-optic response" (1999), <i>J. Mater. Chem.</i> 9 :1257-1261
CH		✓	Sakaigawa, A. and Nohira, H., "Properties of Ferroelectric Liquid Crystal Mixtures Containing Fluorine Substituted Compounds"(1993) <i>Ferroelectrics</i> 148 :71-78
CH		✓	Schmitt, K. et al., "Strongly non- linear optical ferroelectric liquid crystals for frequency doubling" (1993) <i>Liquid Crystals</i> 14 (6) 1735-1752
CH		✓	Seomun, S.S. et al., "Evolution of Switching Characteristics from Tristable to V-Shaped in an Apparently Antiferroelectric Liquid Crystal" (June 1997), <i>J. Appl. Phys.</i> 36 :3586-3590
CH		✓	Takanishi, Y. et al., "Spontaneous Formation of Quasi-Bookshelf Layer Structure in New Ferroelectric Liquid Crystals Derived from a Naphthalene Ring" (June 1990), <i>Jap. J. Applied Phys.</i> 29 (6):L984-L986
		✓	Tuffon, R. P., "Non-Chiral Compounds Exhibiting Alternating Tilt Smectic Phases" (1995) <i>Mol. Cryst. Liq. Cryst.</i> 260 :51-67

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CH		Zhuang, Z., "Interfacial Interactions, Director Configurations and Layer Structures of Surface Stabilized Ferroelectric Liquid Crystals" (1991), <i>Ph.D. Thesis University of Colorado, Boulder CO</i> . 105 pages /
EXAMINER CONSTANTINE HANNAHER		DATE CONSIDERED MAY 14 2003
<small>*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.</small>		

